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CHILD DEVELOPMENT

Fuller 97

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ORGANIZING A PAINTING SET-UP FOR YOUNG CHILDREN

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and

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Board of Education, New York City

Many teachers, eager to begin painting in their schools, are concerned about how to do it to insure development of the children as well as avoid waste and spillings. From our experience in working with children in the age range 2–7 in classrooms and studio, we have written down the points we found to be important in organizing a painting set-up.

We use the headings *Equipment, Space and Time Arrangements, Atmosphere,* and *Care of Finished Paintings.*

Equipment

1. *Brushes.* For young children, long-handled brushes are best. The bristle end should be ⅝ to 1½ inches wide. These brushes are usually numbered 8 to 12. It is best to provide a separate brush for each color used so that children need not wash brushes during the painting period; the possibility of muddying colors by putting the red brush in the green paint is then minimized. Good bristle brushes are expensive but stand up under hard wear. Camel's hair brushes are less expensive but are satisfactory for a shorter time. They shed some hairs in use and do not respond as readily to the painter's intention.

2. *Paints.* Poster-paints; spectrum colors —red, yellow, green, blue at first. Poster-paints cost more than powder paints but are usually better colors and always of smoother consistency and flow. Powder paints are all right if the teacher mixes them thick enough. This mixing takes considerable time. By the ages of 6 and 7 children who have had two or three years of painting can mix their own colors. Furnishing clear unmuddied colors gives the child a heightened sense of color and color contrast; limiting the colors for early painting deepens awareness and makes discreet the nature of color experience.

3. *Paint Jars.* Heavy enough not to tip easily, tall enough to hold the long-handled brush and wide enough at the mouth for the brush to enter readily.

4. *Paper.* 18 x 24 inch newsprint. If paper is bought in larger sheets or by the roll, any necessary cutting to this size should be done in advance.

5. *Easel or Table.* Easel high or low enough for child to be able to reach center of paper with outstretched arms. Table wide enough for paper plus paint jars at side of paper and at height allowing child to reach across to top of paper. Easel or table should be sturdy, and not easily tipped, shaken, or broken.

6. *Water.* The teacher sometimes needs water to thin colors, moisten cloths, etc. This is best kept in a covered metal pitcher or teapot, out of eye range or hand reach of the children.

7. *Aprons or Smocks.*

8. *Cleaning Cloths.* At side of each easel or table. Wash cloths or old Turkish towelling are best. Mop or floor cloth easily available to clean up floor spills. (Rubber sponge cleans an easel most efficiently.)

9. *Receptacles.* Large juice can, vase, or other similar receptacle for brushes which are not being used, and a can, box, or tray for brushes which have been used and are not yet washed.

Space and Time Arrangements

1. *Easels or Tables.* Placed out of way of traffic, with the possibility of quiet in the immediate painting space—a corner or alcove of the room, perhaps. A sloping surface is

preferable to a table or wall. If schoolroom has no easel or table, painting on the floor is preferable to painting against the blackboard, but standing is better than sitting or kneeling. It allows greater arm sweep.

2. *Paint Jars.* Set in easel holders or at right or left side of table, according to the handedness of the child. Supply jars of paint and pitcher of water for mixing paints are kept out of eye range of children, for teacher's use only.

3. *Supply Table.* Placed conveniently for all painters as they work. On it are arranged extra colors for children, in the order Red, Orange, Yellow, Green, Blue, Violet, Black, Brown, etc. to insure ease in selection and replacement. Also on the supply table are the tray or can for used paint brushes, and the extra supply of newsprint paper.

4. *Paper.* Three or more sheets at a time thumbtacked at the top of page onto the easel or table. Children can remove painting without removing thumb tacks by pulling down carefully. Extra supply of paper (not too large an amount) kept within children's reach on supply table. Rest of supply kept flat on shelf (or rolled), out of reach.

5. *Colors for Beginners.* Children aged 2–3 can use one jar of color at a time. Children aged 4–5 can use two jars of colors; a third and fourth can be added later. Five and six year olds working at a table can manage two colors at a time; on the floor they can manage only one at a time unless the jars stand in a pan or box, in which case they can manage two or three, depending on experience. As the two year old works, using one color at a time, the colors not being used can be removed from the easel by the teacher, as she gives, or the child takes, the next color. After a month or so of experience, the three year old can have two colors at once at the easel, without too much spilling or mixing occurring.

6. *Completed Paintings.* Space is necessary to dry paintings. The floor is a good place, often under supply or work tables; other space might be tops of bookcases, shelves, desks, or tables not in use. Paintings dry in from 5 to 30 minutes.

7. *Time Allotments*—a. *Pre-painting period.* Teacher thins the poster-paint to proper consistency (about like thick cream) when preparing jars for children's use. One to one and a half inches of paint per jar is enough. More paint in the jar wets the brush too far up onto the handle and dripping becomes unavoidable. The teacher checks to be sure cloths, paper, paints, brushes, are in place and ready for use.

b. *Painting period.* The child should have at least a twenty minute period ahead of him (with all materials ready for use), before starting to paint. It is desirable to let children paint as many paintings as they wish at one period. It is better to schedule one or two periods of 45 minutes each per week for a child, than more periods of 15 to 20 minutes each. The two year old will probably want to paint only 10-15 minutes. The three year old enjoys 15-35 minutes. When interest in painting is keen the older child may remain absorbed for two hours.

c. *Clean-Up period.* Children 5 to 7 need 15 minutes. Younger children need help in cleaning brushes which are expensive and must be washed after painting, with drying of metal part. Once a week it is a good idea to wash brushes with soap and warm water.

Atmosphere

A relaxing, non-disturbing atmosphere is important for the child when he paints. The teacher in charge of schoolroom or studio establishes quiet by her quiet demeanor and low-pitched voice.

In the schoolroom it is best that painting should not coincide with periods of noisy dramatizations, carpentry, rhythms or dancing. Blockbuilding can take place at a distance from the painting space.

The children soon understand that the child painting should not be disturbed. Freedom from interference from teacher or other children leads to freer emotional expression in painting. More feeling goes into the child's work if he does not talk at the same time that he is painting.

Care of Finished Paintings

1. *Identification.* Child's name, date, and number in series for that day should appear on the painting. The child enjoys painting his name or initials onto his painting if he is able. The older child can also record the serial number and date. For the younger children the teacher adds the name and for many of the older children, she adds the date and number in series. A kindergarten type pencil writes easily, even on damp paper.

Sometimes a child paints eight paintings in a row. Often the teacher wants to know the order in which these were painted and we have developed a system of writing 1, 2, 3, etc. with a ring around it to distinguish this as the serial number for the given date. The next period's painting for the same child starts again with 1, 2, etc.

2. *Drying.* Unless separate space and time to dry is allowed, the paintings stick together when placed in portfolio.

3. *Storing Paintings.* It is a good idea to keep all beginners' paintings intact for their first month of painting. Beyond that, the amount of saving depends on the teacher's interest, available space, etc. When the accumulation of paintings grows too great for the space, discarding can be done when the children are not there.

Portfolios are a convenience and they show a respect for the children's work. After a child has worked hard on a painting, stuffing on a high shelf, destroying, tearing or rolling is disturbing to the child. Sometimes a child asks to take a painting home. If the teacher and child respect and enjoy the painting it will probably be hung at home. If, however, the painting is likely to be torn or thrown out, it is better that the child take his work home very infrequently. If the child insists on wanting to take one which the teacher wishes to keep in school for display or other purposes, he may be willing to paint another "just like it".

4. *Display.* In a place where the paintings will look well and be within easy range of the children's eyes. Black or colored bristol board can be put up and the painting thumbtacked on. If a good spot is located and the bristol board tacked firmly it can stay in place all year as a mount for a series of paintings. Some teachers use a Melton board (15¢ per sheet). Others use Cellotex, soft plywood, thin white pine, or a three panelled screen. As a last resort, with limited space, the easel itself can be used when the children are not painting.

It is well to hang no more than five at a time. The teacher can avoid discussion of which painting is best by choosing the ones to be hung herself, with no comment. This allows each child to reap the full value of his own experience without favorable or unfavorable comparison with other children.

Differences in Set-up, Dependent on Age, Length of Experience, and Type of Room

Whether a few children paint in their school or nursery room while the rest of the group are at other work and play, or a larger group (from one class or from several different classes) paints as a whole in its own room or in a special painting studio, it is important to begin with only a few children painting at one time. Then all the teacher's attention is available to show the how and why the first time and from then on these children can transmit the method to others.

The first child or children to begin ought be fairly mature for age and group, and eager to paint. Such a child will learn quickly himself and will be able to pass on the details to other children just through what he does, with little or no verbal instruction. When the set-up is organized with the degree of specificity we have outlined, the teacher is relieved of all obligation to teach painting to the child other than to show him how to wipe off his brush at the edge of the jar to avoid dripping. This amount of mastery, along with the clarified mechanics of the set-up and non-interference, will carry the child on his own for a long time.

Nursery Room. Age of children, 2–5.

Number of children who can profitably work at one time at start of painting experience.

Age 2 and 3—one at a time.

Age 4 and 5—one or two at a time.

It is well for 2 and 3 year olds to have at least two or three opportunities to paint before the other children are shown how to begin. Two and three year olds almost always need an adult's help in taking one color from the easel and getting another from the supply table, removing paper, buttoning smock or tying an apron. Four and five year olds can manage these things for themselves, once they know how.

After some painting experience as many as six children (at 3 double easels) can paint at one time. If tables are used, four can paint at one time. Tables take more space in a room and more care is necessary to avoid accidents.

Primary Room. Age of children, 6–7–8.

At start of painting experience it is best for the teacher to spend two or three 45

minute sessions alone with two mature children, acquainting them with the procedures, at a time when the other children are not in the room. Very soon these two children spread the details to the rest of the children and at this age the children can manage the process independent of adult attention.

After some painting experience, six children can paint at once at easels, four at tables. .

Studio Room. Age of children, 2–7, if an art specialist or very experienced person is in charge. A three year range is easier to handle.

At beginning of painting experience the teacher begins with two to four children; when these are painting others can come in two at a time to get started.

After some painting experience the maximum number of children who can profitably work together is 20, and then the teacher needs an assistant (who may be as young as 11–12). Without an assistant, the maximum number of children is 12.

Discussion

Some educators and psychologists have asked us whether such order and exactness were not repressive to children. We find, on the contrary, that order in the details and mechanics allows great freedom and scope in the expression of feeling, mood, and idea (which we call communication) and in the quality and variety of the paintings. Adults of our generation, reacting against their education which limited the child and hampered many of his natural impulses, often confuse order and exactness with repression and restriction. Order at its best can enable one to do, enjoy, and understand many activities whose richness and complications might otherwise keep them out of one's life.

Work with young children makes clear that the provision of good materials and control allows for a rich program which avoids many problems and unnecessary frustrations. Good materials and equipment, and a good work and play situation are so satisfying in themselves that the child accepts the essential control and uses it as a frame on which to build his knowledge of the world about him.

From our experience we find the essentials of the painting situation for young children to be:

1. Good materials—bright, clear colors; large long-handled brushes; large sheets of paper.
2. Conveniently placed, sturdy equipment.
3. The possibility of free, sweeping arm movements.
4. A relaxed, relatively quiet atmosphere in which to paint, without interference from adults or other children.

By considering these essentials, and her own situation, a teacher can arrive at her own painting set-up. There are other painting situations which lead to growth in and through painting, but the materials, their use and arrangement, are important.

An ordered set-up means that a child's full attention can go into the expression of his feeling, rather than into adjustments to the situation. With order the teacher is relieved of concern over waste and accidents. The possibility of their occurrence is lessened and effective means of coping with them is provided.

A teacher may want to use only a few of our suggestions; frequent use of the same procedures will clarify the painting situation and she can then find what arrangements and procedures work best for her and her children.

Summary

We have tried to find the elements most essential for a child's joy and growth in painting and to show how to provide the child with them so that he can learn to take care of his own needs and be free to put his individual, unique feeling onto the paper. We feel assured that this experience is satisfying to the child as he paints, and that it will serve as a sound foundation for later art experience and appreciation.

We believe that the suggestions we made for organizing a painting set-up for young children are detailed and explicit enough for use or adaptation by the teacher who is relatively inexperienced in this area.

Further articles will describe the values of the early phases in the development of children's paintings,* and the ways the teacher can guide a child so that he is able to paint satisfactorily at his phase level, with a balance between mastery and communication of feeling.

* Besch, Vera and Bressler, Mary, "Phases in the Development of Children's Painting, *Journal of Experimental Education*, September (1944, pp. 1–4).

DEVELOPMENT AT THE YOUTH LEVEL OF A CONCEPTION OF THE CAUSES OF BEHAVIOR AND THE EFFECTIVENESS OF A LEARNING PROGRAM IN THIS AREA

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There are many concepts which seem important for the effective guidance of children. It is helpful to know to what extent these concepts are operative in the thinking of those individuals who are assuming the responsibility for guiding children or who are preparing to assume such responsibility. It is also useful to know how effective a learning program can be in developing the concepts to the level required for application to the many different kinds of behavior problems one meets in everyday life.

The present study is built around the conception that the ordinary behavior of children such as refusal to comply with simple requests, refusal to cooperate, and destructiveness is relatively complex in that it may be the result of a number of causes, and that the methods of redirecting behavior vary with the underlying causes. Judging from the preliminary data and from observation these concepts are not well developed in the general population.

This study was designed to determine to what extent the concepts are operative in specified groups of adolescents, and how effective a learning program is in developing the concepts.

The first purpose of the study was accomplished by analyzing data relative to the development of these concepts in a relatively large group of adolescents; the second, by studying the growth of the concepts before and after a learning program was administered.

DEVELOPMENT OF CONCEPTS BEFORE FORMAL LEARNING

The subjects of the first part of the study were 1172 high school students. It was desired that about half should be drawn from freshmen classes and half from the senior classes. Because of slight variations in promotional procedures among the schools a few sophomores and juniors were included as indicated by the following tabulation:

	Total	Boys	Girls	Mean Age
Freshmen	487	248	239	14.88
Sophomores	54	-----	54	15.93
Juniors	57	12	45	16.72
Seniors	574	252	322	17.89
Total	1172	512	660	

About one-fourth of the subjects were from schools located in towns of less than 5,000 population, about one-third were from cities of approximately 10,000; and slightly less than one-half were from cities larger than 40,000.

Intelligence test scores were available for 1033 of the subjects.

The test used to measure the growth of the concepts was of the multiple choice type. It consisted of twenty-five brief descriptions of behavior problems each followed by five statements. The subject was instructed to check as many of the statements as he thinks apply to the problem. The following is one of the test items used in the study:

George is five years old. He and his father are very good friends. The father is a farmer. George helps with almost every task about the farm. The father usually eats potatoes, gravy, meat, bread, butter, and pie. He considers vegetables and salads women's food. Recently George has been refusing to eat carrots and green beans. Which of the following statements are possible reasons why George will not eat carrots and beans?

____1. He has inherited a dislike of vegetables from his father.

____2. George may have heard his father say that vegetables are women's food.

[1] This report is a condensation of some of the results reported in the writer's thesis for the doctorate at the Iowa Child Welfare Research Station. The study was directed by Dr. R. H. Ojemann. It was made possible, in part, by the Ellen H. Richards Fellowship of the American Home Economics Association.

----3. Perhaps George is trying to do everything just as his father does.

----4. Most children this age do not like vegetables. They cannot learn to eat many of them until they are older.

----5. None of the above seem to be good reasons.

Note that the question asked is: "Which of the following statements are possible reasons why George will not eat carrots and beans?" The question is not: "Why does George refuse to eat carrots and beans?" It would be impossible to answer such a question from the information given.

Consider the first choice offered in the problem given above. The statement is made that "He has inherited a dislike of vegetables." This statement takes into consideration only one cause for the behavior; the available evidence does not support such a dogmatic statement. Statement four also implies that there is only one cause for the behavior, *i. e.*, five-year-old children cannot learn to eat many vegetables. Clinical and experimental evidence relative to feeding young children has shown that this is not true. Choices two and three suggest some possible explanations in the form "may have heard" and "perhaps is trying". Choices two and three are considered acceptable statements; choices one and four are not acceptable. In this illustration number five is not an acceptable statement because some of the other statements are good reasons.

The form of the question following each description of behavior has been varied. In the example just given the question is "Which of the following statements are possible reasons why George will not eat carrots and beans?" In some items the form is "When such problems are studied we tend to find that." or "Which of the following reasons do you think help to explain Jack's behavior?" or "There has been much discussion as to the causes of the behavior. With which of the following suggestions do you agree?"

Reliability was computed by splitting the test into halves and applying the Spearman-Brown prophecy formula. The coefficient of reliability is .83 for 100 seniors selected at random from the 574 available, and .79 for 100 freshmen taken at random from the 487 available.

Results

The mean test score of the entire group of 1172 high school students was 51.36; the σ for the group was 13.98. The scores ranged from 11 to 94. The possible score is 100. This mean score which is only slightly more than one-half of the possible score indicates that many high school students do not have a working knowledge of the concept of the multiple causation of behavior.

Table I shows the difference in mean scores for high school boys and girls. The mean test score for the boys is 46.79; for the girls it is 54.40. This difference between the test scores is significant beyond the 1 percent level of confidence. There is also a significant difference in favor of the girls when the test scores of freshman boys are compared with those of freshman girls, and when the test scores of senior boys are compared with those of senior girls.

Table I

Comparison of Test Scores of High School Girls and High School Boys When Groups Are Equated as to IQ

	IQ					Test Score			
	N	M	σ	t.	t at 5% level	M	σ	t	t at 1% level
Girls	542	105.08	10.80	.15	1.96	54.40	12.40	9.28	2.58
Boys	447	105.19	12.45			46.79	14.18		

It seems likely that the difference between boys and girls in understanding of the factors underlying behavior is due to the training which each receives in our culture. From early age girls are encouraged to play with dolls. This play often means reliving family situations. Girls also share in the care of younger children; by high school age many

girls are earning their spending money by caring for children after school hours. Any similar interest in doll play or in younger children on the part of boys is usually discouraged in our culture.

The students in the experimental and control groups were given the test and later were retested. The learning program was administered to the experimental group while the control group proceeded with the regular work of the school which did not include any formal training relative to the causes of behavior.

TABLE II

COMPARISON OF TEST SCORES OF HIGH SCHOOL FRESHMEN AND HIGH SCHOOL SENIORS WHEN GROUPS ARE EQUATED AS TO IQ

	Age			IQ				Test Score			
	N	M	σ	M	σ	t	t at 5% level	M	σ	t	t at 1% level
Freshmen	440	14.88	.77	105.31	12.70	1.72	1.96	46.88	13.06	9.52	2.58
Seniors	494	17.89	.78	106.79	13.38			54.97	13.72		

As is shown in Table II, 440 freshmen and 494 seniors took the survey test. The freshmen made a mean score of 46.88; the mean score for seniors is 54.97. It can be asserted with a high degree of confidence that there is a real difference between the mean scores for these two groups. Comparisons of mean test scores of freshman girls with senior girls and of freshman boys with senior boys also show significant differences in favor of the seniors.

A detailed study of test responses indicated that the conception of behavior held by these adolescents is one of relative simplicity—behavior is to be explained in terms of one factor or some "rule of thumb". not the rich complexity which analysis reveals.

THE EFFECT OF A LEARNING PROGRAM

The problem now arises, "Can an enriched conception of behavior be developed at the adolescent level?" The second part of this study was directed toward this question.

The subjects for the learning program were all girls, members of home economics classes in two schools. The following tabulation gives the distribution of subjects for both the experimental and control group:

Experimental group	Total	Fresh.	Soph.	Junior	Senior
School A					
First year H. E.	16	13	3		
Second year H. E.	12		11		1
School B					
Section I	22		14	5	3
Section II	23		12	9	2
Total	73	13	40	14	6
Control group					
School A	11			7	4
School B	22		9	8	5
Total	33		9	15	9

The learning program consisted of three forty-minute discussion periods together with the study of three specially prepared pamphlets. Each pamphlet was devoted to a discussion of the three areas included in Part I of the test, namely, eating, destructive behavior, and lying.

The titles of the pamphlets were: Ann Won't Eat Oatmeal, Dick is Destructive, and John's Grades Cause Trouble.

The test to measure growth was so designed that it could be divided into three parts. Part I consists of three eating problems, three problems of destructive behavior, and three problems of lying. The age range of the childden in these situations is from two to ten years. Part II consists of eight behavior problems not including any of eating, destructive behavior, or lying. The age range is also from two to ten years. Part III consists of eight behavior problems. These include one eating problem, one of destructive behavior, one of lying, and five of other kinds of behavior. The age range in these situations is either younger than two years or older than ten years.

Each problem is discussed in detail and many possible causes for the behavior are suggested. Emphasis is placed on the idea that before an attempt is made to redirect the behavior one must look for the factors causing the behavior. The idea is also emphasized that every similar problem may have many different causes. The pamphlets, and also the test, were analyzed for reading difficulty by the method described by Gray and Leary[2]. All of the reading materials fall in the area of "easy" or "very easy" reading.

The investigator was careful to limit the first three discussions to problems of eating, destructive behavior, and lying. The examples used during these discussions were of children within the age range from two to ten years.

The retest was given on the fourth day. The same test items were used for the retest as for the first test; they were arranged in a different order.[3]

[2] Gray, William S. and Leary, Bernice E. *What Makes a Book Readable with Special Reference to Adults of Limited Reading Ability*. Chicago: University Chicago Press, 1935. Pp. 358.

[3] The learning program is described in detail in a thesis by the writer on file in the University of Iowa library.

Results

Table III shows the changes in test scores on part I of the test for the experimental group following the learning program and for the control group. The experimental group made a mean gain of 6.08 points; the mean gain for the control group was 1.55. When the gains were adjusted for differences in intelligence quotients by the method of covariance, the adjusted difference in gains was significant beyond the 1 percent level of confidence.

The changes on Part II of the test for the experimental group and for the control group are shown in Table IV. The experimental group made a mean gain of 2.38 points; the control group gained 1.61 points. There was not a significant difference between the gains of these two groups when the gains were adjusted for differences in IQ by the method of covariance.

In Table V are shown the changes made by the experimental group and the control group on part III of the test. On the retest following the learning program the experimental

TABLE III

GAINS ON PART III OF TEST FOR EXPERIMENTAL GROUP AND CONTROL GROUP HOLDING INITIAL IQ CONSTANT

	Experimental Group	Control Group	F_o	F_t (1%)
N	73	33		
M	6.08	1.55	24.13	6.90
σ	4.15	4.25		
Mean Initial IQ	103.30	109.00		
Mean Initial Score	19.43	21.33		

TABLE IV

GAINS ON PART II OF TEST FOR EXPERIMENTAL GROUP AND CONTROL GROUP HOLDING INITIAL IQ CONSTANT

	Experimental Group	Control Group	F_o	F_t (5%)
N	73	33		
M	2.38	1.61	.67	3.94
σ	4.74	3.72		
Mean Initial IQ	103.30	109.00		
Mean Initial Score	17.42	18.94		

TABLE V

GAINS ON PART III OF TEST FOR EXPERIMENTAL GROUP AND CONTROL GROUP HOLDING INITIAL IQ CONSTANT

	Experimental Group	Control Group	F_o	F_t (5%)
N	73	33		
M	3.93	1.94	5.44	3.94
σ	4.99	3.34		
Mean Initial IQ	103.30	109.00		
Mean Initial Score	16.60	19.15		

group made a mean gain of 3.93 points; the mean gain for the control group was 1.94. After the gains were adjusted for differences in IQ by analysis of covariance, the difference in gains between the two groups was significant beyond the 5 percent level of confidence.

These findings indicate that young people of high school age of the type used in this investigation showed increased understanding of the causes of the kinds of behavior problems which had been discussed in the learning program. They also tended to show an increase in understanding of the same kind of problems when they were found at other age levels. They did not, however, make the generalization necessary for applying the principle to other kinds of behavior problems.

Summary

The results of the survey test show that an understanding of the causes of behavior is not well developed even at the senior level in high school. For the majority of people formal education ends with graduation from high school. This makes it important that concepts which are needed for understanding children's problems be developed during the high school years.

The analysis of the results of the learning program tend to indicate that it is not easy to develop the concept that there are many factors underlying behavior to its generalized form so that it will function in a wide variety of situations. It may be necessary to use more than three different kinds of behavior patterns to develop the generalized form.

EVALUATION OF A PROLONGED PRE-ACADEMIC PROGRAM FOR HIGH GRADE MENTALLY DEFICIENT CHILDREN IN TERMS OF SUBSEQUENT PROGRESS

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The Prolonged Pre-academic Program is an experimental educational unit at the Wayne County Training School. It was designed for mentally deficient children under twelve years of age with I.Q.'s 60–79 inclusive. Its goal was to show that postponement of academic instruction until the child's mental age was as much as two years in advance of his educational age would yield dividends in faster progress, better adjustment, and better effort in the academic situation, with an eventual achievement level as high as would have been obtained through continuous academic instruction throughout the school years. The program for the pre-academic years stressed reading readiness, social living and work habits in an enriched and stimulating environment. The experiment, which up to the present has included only boys, has now been in operation for five years and the following report is an evaluation of results.

Selection of Experimental and Control Groups

The population from which the experimental group was selected included all boys admitted to the Prolonged Pre-academic Program who remained there six months or more and were transferred to an academic program on or before January 1, 1943. There were 112 children in this category.

A control group was selected from a population including all six, seven, eight, and nine year old boys admitted to the institution in 1926-1935 inclusive who did not come into the experimental unit when it was first organized. Twenty-nine ten year old boys were selected at random from admissions during these years, because this gave a proportion of ten year old boys equivalent to that in the experimental population. There were 98 children in this population of controls.

Records of some children from both populations were excluded from consideration for the following reasons: (1) the child left the institution; (2) an error in birthdate was discovered after a period of years (one child from each population); (3) an I.Q. of 90 or over was obtained on one or more tests; (4) the I. Q. sank below 50 before eleven years of age and remained there; (5) pathology developed, such as neuro-syphilis, brain tumor, postencephalitis and the like. These exclusions amounted to 28.6 per cent of the experimental population and 30.4 per cent of the control population.

An additional 18 children (16.1 per cent) were excluded from the experimental population because they entered a special program for the children whose deficiency was due to exogenous causes. No child was excluded from either group because of exogenous classification alone. The effect of the inclusion of exogenous children who otherwise met the criteria in the control population and the withdrawal of some of them from the experimental population will be discussed in relation to the achievement averages.

After these discards there were 62 children in the experimental population and 69 in the control. These children were then divided into three I.Q. groupings according to tests given within six months of the time of institution entrance. Those with I. Q.'s below 60 or over 79 at entrance are disregarded in this report. The group with which this study is concerned is that for which the program was originally intended, namely: those with I.Q.'s 60–79 inclusive. There were 49 of these in the experimental population, 53 in the control, 79 per cent and 76 per cent respectively of the populations after the discards. Two children included by all criteria up to this point in the experimental group had not yet been tested

[1] From the Wayne County Training School, Northville, Michigan, Robert H. Haskell, M.D., Medical Superintendent. Department of Research, Thorleif G. Hegge, Ph.D., Director of Research and Education.

for academic achievement at the 12 year level; therefore, the experimental group actually consisted of 47 children.

Intelligence Test Scores

Because of a change in the institution testing program, the children in the experimental group were examined on the Terman-Merrill intelligence examination, whereas the children in the control group had been examined on the Stanford Revision of the Binet. There were a few exceptions to this rule in both groups. Terman and Merrill showed that average I. Q.'s obtained from administration of the two revisions were practically equivalent up to 12 years of age. After 12 years of age, the authors of the scale found that averages obtained on the Stanford Revision were from 3 to 6 points lower than those on the Terman–Merrill. In the figures given in this study, therefore, it seems likely that comparisons are valid at institution entrance and at the 11 year level, but that averages for the control group might have been at least as high as those for the experimental group at the 15 year level had they all been examined on the Terman-Merrill.

Section 1 of Table I shows the average chronological ages, average I.Q.'s and the test forms used for both groups at the time of institution entrance and at the time when the members of the experimental group were transferred to the academic program. The averages for the control group at 15 years of age are also given. This is the age level of the last academic achievement test, since academic instruction is terminated at 16.0 years of age.

Only 17 members of the experimental group have had their last academic achievement test. In Section 2 of Table I, the averages of the first 17 members of the control group, which was arranged in alphabetical order, are compared with averages for these 17 from the experimental group. The scores for these two groups of 17 are given at each age level to show how well they represented the whole group.

Another point to be considered in comparing the group averages is the frequency of the testing. The children in the experimental group averaged 1.1 tests per year while those in the control group had only .7 per year. The children in the control group, however, were tested about once a year up until 11 or 12 years of age, and it is just at this point where the greatest difference is shown.

Academic Test Scores

In comparing final academic achievement scores, the same difficulty was encountered as in comparing intelligence test scores, namely: the tests used were not identical. Prior to 1938, the 1929 revision of the Stanford Achievement Test was used in the annual school achievement tests. Children who scored below grade 2.5 were given the Gates Reading Examination. In 1939, the Metropolitan Pri-

Table I

Average Ages and I. Q.'s of Experimental and Control Groups at Three Age Levels

	No	C.A.	I.Q.	Test forms used St. Rev.	T.M.
Section 1. Complete Groups					
Experimental	47	9.0	69.9	19	28
Control	53	9.0	69.9	53	0
Experimental	47	11.4	70.6	3	44
Control	53	11.5	65.9	49	4
Control	50	15.6	62.3	33	17
Section 2. First 17 Members of Each Group					
Experimental	17	9.0	70.0	14	3
Control	17	9.0	71.1	17	0
Experimental	17	11.8	69.1	3	14
Control	17	11.4	66.9	16	1
Experimental	17	15.7	65.6	0	17
Control	17	15.5	63.6	9	8

mary Battery was substituted for the Gates. In 1940, the 1940 revision of the Stanford Achievement replaced the 1929 revision. In 1942, the Metropolitan Primary and Intermediate Reading and Arithmetic tests replaced the Stanford Achievement tests entirely.

As a result of these shifts, the majority of the experimental group was examined on some form of the Metropolitan test, while the majority of the control group had been examined on some form of the 1929 revision of the Stanford Achievement.

To overcome this difficulty, it was necessary to discover whether or not grade averages obtained on these two examinations were equivalent.

Fifty-five school boys at the 15 year age level were examined on reading and arithmetic by both the Metropolitan and the 1929 revision of the Stanford Achievement tests. The tests were given on successive days, approximately half having the Metropolitan first, the other half having the Stanford first. The Stanford mean was grade 3.73 S.D. .117; the Metropolitan mean, grade 3.89 S.D. .112. The difference of .16 grade, S. D. .165 does not reach the 5 per cent level of significance and there is the added consideration that these children were accustomed to the Metropolitan tests while the Stanford Achievement was a new test to them.

On the other hand, the above figures are calculated on the entire range of both tests, from primary through intermediate. There were 37 of the 55 who had the Stanford Primary and the Metropolitan Primary reading and arithmetic tests. The means here were: Stanford grade 3.39 S.D. .08; Metropolitan grade 3.67 S.D. .07. The difference of .28 grade, S.D. .106, is significant at the 1 per cent level.

With the help of these comparisons, we may evaluate the results from our experimental and control groups shown in Table II. At each age level there were some children who, for some reason, were not tested at that age level but for the most part the reason was not low achievement. Of the 9 children absent from the control group at the 15 year level, 8 were present at the 14 year level and averaged grade 3.2 which compares favorably with the grade 3.3 achieved by the whole group.

With the possible test differences in mind, we may make the following statements on the basis of Table II.

(1) The difference between the two groups at the 11 year level is in favor of the control group, whether or not the true difference is as large or larger than the difference shown.

(2) Since the first 17 members of each group had average scores almost identical with those of their total groups at the 11 and 12 year levels, it is likely that their scores are representative at the 15 year level, also.

(3) It is unlikely that the true difference in the grade averages at 15 years of age would

TABLE II

AVERAGE SCHOOL GRADES OF EXPERIMENTAL AND CONTROL GROUPS AT THREE AGE LEVELS

	No.	C.A.	Grade	Tests used St. '29	Met.	Gates	St. '40
Section 1. Complete Groups							
Experimental	46	11.4	1.6	0	31	15	0
Control	43	11.5	2.2	27	0	16	0
Experimental	47	12.5	2.3	4	40	2	1
Control	47	12.6	2.6	35	3	9	0
Control	44	15.5	3.7	28	8	0	8
Section 2. First 17 Members of Each Group							
Experimental	16	11.8	1.6	0	2	14	0
Control	15	11.3	2.2	9	0	6	0
Experimental	17	12.6	2.4	4	11	2	0
Control	15	12.5	2.5	10	1	4	0
Experimental	16	15.7	3.7	0	13	0	3
Control	16	15.5	3.7	10	3	0	3

have been more than .3 grade had they all been examined on the same test. Again it should be mentioned that the comparison for test equivalence was made on children familiar with the Metropolitan but not with the Stanford.

(4) Since the proportion of Stanford to Metropolitan tests is fairly constant at the three age levels, it is valid to compare the differences in grade averages from age level to age level. At the 11 year level, the difference is —.6 grade for the experimental group; at the 12 year level, it is —.3; at the 15 year level it is 0. The conclusion is that the experimental group progressed faster than the control group.

For the grade achievement of the first 17 members of the control group at the 15 year level, the variance was 1.17, for the experimental, .34. The difference is significant at the 1 per cent level. The difference in variance between the two tests when given to the same children was not significant. The distribution in the two groups was as follows:

Grade	Experimental	Control
5th	0	2
4th	9	4
3rd	6	4
2nd	2	7

Second grade achievement at 15½ years of age may be considered failure for the I.Q. levels represented here. In the experimental group, then, there were 29 per cent fewer failures than in the control group, although some in the control group obtained higher scores than did any in the experimental group.

There is another factor, however, which must be considered in evaluating the performance of the two groups. Three children in the experimental group and two in the control group had remedial help in reading. All three in the experimental group finished in the third grade; only one of the two in the control group did so. Assuming that all of these children would have finished in second grade had no remedial help been given, the standing would have been:

Grade	Experimental	Control
5th	0	2
4th	9	4
3rd	3	3
2nd	5	8

There would still have been 18 per cent fewer failures in the experimental group. Furthermore, the three children in the experimental group who received remedial help were all who qualified for it by virtue of mental age two years in advance of achievement age (after a year or more of academic instruction), while three additional children in the control group could have qualified by the same criterion. In other words, there was less need for remedial help in the experimental group.

Among the first 17 members of the control group, there were two children classified as exogenous. Their grade average was 4.1. Since the group average was 3.7, they did not tend to lower the grade average in that group. There were no children classed as exogenous in the first 17 members of the experimental group.

Discussion

The foregoing data encourage us to assert that the first assumption of the hypothesis upon which the Prolonged Pre-academic Program was founded is likely to prove correct. Mentally deficient children of the I.Q. levels 60-79 inclusive, educated on the time schedule described, appear to progress in academic work when it is introduced at a rate which enables them to arrive at approximately the same average grade level by 16 years of age as they would have achieved had academic instruction started at the earliest possible mental age and been given continuously. There is some indication in the distribution of grade levels that there are fewer failures under the prolonged pre-academic system, although there may also be fewer instances of achievement much above the average.

Adjustment

The argument in favor of readjusting the educational time schedule for late introduction of academic work rests on social values to the extent that better adjustment in the academic situation and a more constructive attack on academic learning might be expected from children who are sufficiently mature to find the beginning steps easy. Children who have struggled with scarcely measureable success to read and grasp number concepts for five or six years are apt to develop antagonistic or defeatist attitudes. In the standard school situation, also, more restraint

of motor activity is usual than seems healthy for retarded children. There are many things which children of this age, especially children from deprived environments, should be learning from experiences; many lessons in social cooperation which can be learned only through active group projects. It seems logical to concentrate on the things these children are eager to learn at the early ages, to build good work habits in these fields, and to leave the academic work until they reach a mental maturity when they are also eager to learn these skills, provided their final level of academic achievement does not suffer. Better personality adjustment in the school years should also lay a better foundation for success after parole.

The previous section indicated that final academic level, so far as we could ascertain, did not suffer. Comparison of the experimental and control groups in social adjustment is more difficult because no group measurements are available for the control group as a whole. Reports of success on parole are available for the control group but not yet for the experimental group. Furthermore, the social and economic conditions into which our experimental group is going and will go are drastically different from those into which children from the control group were paroled. Comparisons of the two groups in success on parole may never be valid.

Within the institution, conditions also change, but on the whole they are more stable than in the community. There is one measure of adjustment which has been applied to some of the children in both groups in their academic school years. This is the Rating Scales for Adjustment developed by M. Patterson at the Wayne County Training School. There are eight scales measuring, respectively, cooperation with authority, cooperation with other children, work habits, honesty, conformity, happiness, outgoing behavior and emotional stability. There are nine steps in each scale. Scores from 1.0 through 4.9 show excellent to average adjustment; scores from 6.0 through 9.0 show grades of poorer than average adjustment. The scores on these nine scales can be averaged for a general adjustment score.

The first general rating of school children on the scales was made in January, 1940. Each child was rated by his academic and his handwork teacher. At that time there were 20 children of the control group still in school. Their ages averaged 14.6.

In June 1942 both academic and handwork teachers rated all children but in January 1943 they were rated only by the academic teachers; in June 1943, only by handwork teachers. In order to have an age group comparable to the controls, ratings on children in the experimental group at all three of these dates were used. The average age of 34 children rated by academic teachers was 14.4, by handwork teachers, 14.6. Table III shows the results.

The average life ages and I.Q.'s at institution entrance of the two groups were almost identical: experimental group, 8.89 and 70.1; control, 8.73 and 70.4. The average ages at the time the ratings were made were the same. The average scores in both academic and handwork situations were slightly in favor of the experimental group, but there was no significant difference. The significant difference which emerged was the greater variability of the control group as compared with the experimental group. In the control

TABLE III

SCORES OF CHILDREN FROM EXPERIMENTAL AND CONTROL GROUPS ON THE RATING SCALES FOR ADJUSTMENT

Section 1. Average Scores

		Academic Teacher			Handwork teacher		
	No.	C. A.	Score	V	C. A.	Score	V
Experimental	34	14.4	4.58	1.26	14.6	4.48	.91
Control	20	14.6	5.22	2.88	14.6	4.85	2.26

Section 2. Number of Poorer Than Average Scores

		Academic Teacher		Handwork Teacher	
		No.	%	No.	%
Experimental	34	3	8.82	2	5.88
Control	20	9	45.00	5	25.00

group, 9 scores by academic teachers and 5 by handwork teachers were in the range from 6.0 to 7.9, while in the experimental group the number of scores in this range was 3 and 2. In terms of percentages, 45 per cent of the control group was rated as poorly adjusted in the academic situation, 25 per cent in the handwork classes, with a difference of twenty per cent between the two situations. In the experimental group, the corresponding percentages were 8.8 and 5.9, a difference of 2.9 per cent. In short, the percentage of individuals maladjusted in school in the control group was approximately 5 times that in the experimental group, and the difference in percentages between academic and handwork situations in the control group was 7 times that in the experimental group.[2]

Discussion

The only measure of social adjustment available for comparing some members of the experimental and control groups near the end of their school training indicated that there were significantly fewer maladjusted individuals in the experimental group, especially in the academic classroom. This is the result hoped for from the Prolonged Pre-academic Program. Concomitant with better adjustment was faster and more general academic progress than was obtained under the conventional educational schedule. It would be impossible to say which is cause and which is effect, but we are inclined to explain the results in these terms: the Prolonged Pre-academic Program follows the natural developmental trends for these children instead of forcing them into a schedule designed for children developing at faster rates. The result is better personality adjustment throughout childhood, with less frustration, more normal emergence of interests and consequent better progress in learning situations.

[2] There was only one child in the control group classed as exogenous and he was not one of the 9 behavior problems. There were no exogenous children in the experimental group.

References

Curtis, E. Louise. "Building Toward Academic Readiness in Mentally Deficient Children," *American Journal of Mental Deficiency*, XLVIII, (1943). Pp. 183–7.

Etz, Elizabeth. "Pre-academic Activities to Challenge the Mentally Deficient Child from Five to Eight Years of Mental Age," *American Journal of Mental Deficiency*, XLVIII, (1943). Pp. 179–82.

Hegge, Thorleif G. "Special Reading Disability with Particular Reference to the Mentally Deficient," *Proceedings of the Fifty-eighth Annual Session of the American Association on Mental Deficiency*, 1934. Pp. 297–346.

—. The Problem of Reading Deficiency in the Mentally Handicapped. Journal of Exceptional Children, Vol. 4, No. 6, March 1938. Pp. 121–5.

Melcher, Ruth T. [Patterson, R. Melcher] "A Program of Prolonged Pre-academic Training for the Young Mentally Handicapped Child," *Proceedings of the Sixty-third Annual Session of the American Association on Mental Deficiency*, XLIV, (1939). Pp. 202–15.

—. "Developmental Progress in Young Mentally Handicapped Children Who Receive Prolonged Pre-academic Training," *American Journal of Mental Deficiency*, XLV, (1940). Pp. 265–73.

—. "Organization of a Residence Unit for Pre-academic Training of Mentally Deficient Children," *American Journal of Mental Deficiency*, XLVIII, (1943). Pp. 174–8.

CHILDREN'S IDEAS ABOUT THE WAR

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How much interest do young children have in the war? What do they know about it? How do they find out? What do they think about it? How do they feel about it? In what ways do they express their feelings? With these questions in mind, a study was undertaken by the writers to obtain a picture of children's knowledge and attitudes concerning the war.

THE EXPERIMENT

Techniques and Procedures. The techniques employed in the study consisted of systematic interviews with children, supplemented by observations of children's conversations with each other in informal situations. Other evidence of interest in the war as expressed in creative work, block building, and dramatic play was also noted. Another approach was made by giving each child an opportunity to choose the picture liked best of several, three of which depicted war scenes. Most of the data were collected during the month of April, 1943.

The Subjects. Twenty-one children, twelve boys and nine girls, between six and seven served as subjects for the study. These children, representing a high socio-economic group, were attending the first grade at Lincoln School, New York City. The median I. Q. of the group was found to be 120.5 The I.Q.s were obtained with the following tests: Stanford Revision of Binet Test, Otis Primary Group Intelligence Test, and Detroit First Grade Intelligence Test. Table I summarizes the distribution of sex and intelligence.

TABLE I

DISTRIBUTION OF TOTAL GROUP ACCORDING TO SEX AND INTELLIGENCE

I. Q.	Boys	Girls	Total
130–139	3	3	6
120–129	3	1	4
110–119	3	4	7
107–109	3	1	4

The Picture Test. As one means of investigating these children's ideas about the war and preference for the war theme, they were shown a series of seven pictures, three of which related to the war, four to other themes. The series of pictures was laid out before each child, his spontaneous conversation was noted while he studied the pictures and he was asked to choose the picture or pictures he liked best.

In selecting the pictures to be used for the study, a search was made through back copies of *Life Magazine* to locate pictures of the same size done in black and white so that neither color, size, nor shape would influence the choice made by the child. A more difficult problem was to find pictures of sufficient familiarity and interest to balance the dramatic quality of the war pictures. Seven pictures were finally selected for the study, as follows:

1. Children playing in the snow. 2. Grandmother examining a small boy's foot. 3. Statue of Liberty at night. 4. Large white rabbit. 5. Cartoon of Hitler and Mussolini struck down by the flags of Britain, Russia, and the United States. 6. Soldiers disembarking from a ship. 7. Dive bombers in flight over the Pacific Ocean.

The Interview. An interview was conducted with each child individually by one of the writers, Miss Geddie. The interviewing was planned beforehand. Questions were selected which would serve to draw out each child's ideas and attitudes toward the war, and the interview period was carefully planned so as to consume a reasonable period of time.

Preston's[1] interview form used in a similar study served as a guide for selecting questions. Since the children themselves, in the first few interviews, volunteered more information than had been anticipated, revisions were made to include more items in that area. The questions were grouped as follows:

[1] Preston, Ralph C. *Children's Reactions to a Contemporary War Situation.* New York: Bureau of Publications, Teachers College, Columbia University, 1942.

A. Information and Sources of Information.
B. Location of Fighting Forces and Conceptions of the Soldier's Work.
C. Relation of Play Activities to War.
D. Dreams about the War.
E. Knowledge of and Attitudes toward Leaders in the War.

The following questions were used in the interview:

A. Have you heard about the war? Tell me what you know about it. How did you find out about the war? Talking with somebody at home? Somewhere else? With grown-ups besides your parents? Other boys and girls? Do you ever hear anybody read the headlines in the newspapers? Do you look at war pictures in the newspapers or magazines? Do you ever listen to war news on the radio? Do you ever see war pictures in the movies? Do you like to hear about the war? Why?

B. What do soldiers do? Where are our soldiers now? Is anybody in your family in the war? Who? Where is he now? What does he do?

C. What do you like to play outdoors? Indoors? What do you like to play best? Do you like to play war? Do many boys and girls that you know play war? How do they play war? Do you have a soldier's suit or a nurse's uniform? A gun? Toy soldiers? Airplanes? Battleships? What do you build when you build with blocks?

D. Do you ever dream about the war? Tell me about those dreams.

E. Have you ever heard of Hitler? Who is he? Which side is he on? What do you think of him? Why? Who is the leader on our side? What does he do? What do you think of him? Do you know who the leaders are in some other countries?

For each child three letter-size sheets of paper were stapled together with the letters A, B, C, D, and E to indicate topics and numbers under each letter for the questions included in that topic. Opportunities for the interviews were found at the beginning of the school day and at other times when the group as a whole was scheduled for special classes in fine arts, physical education and the like. The interviews were held in a small workroom adjoining the regular classroom. Two of the interviews, for unavoidable reasons, were done in the homes of children with the mother present; otherwise no third person was present. Since the interviewer had been associated with the group throughout the year, there was a friendly, informal atmosphere. Except in two slight instances, no sense of strain was noted, nor was any increased tension over the war due to the interviews shown in any case. A short informal conversation served as an introduction to the interview. Each interview lasted from 20 to 30 minutes depending on the individual's interest and ability to express himself verbally. The child was given freedom to talk beyond the questions and usually did so.

Observations of Children's Conversations. Because of the flexible program in the school there were many occasions when these children talked freely with each other. Plenty of time was given for taking off and putting on wraps, changing gymnasium shoes, putting on smocks, washing up for lunch and various other living-together situations. The investigator was able to record several detailed conversations of children relating to the war situation.

Observations of Block Building, Dramatic Play and Creative Work. Block building and dramatic play at this age level are integral features of the Lincoln School program. There were many small blocks in the classroom, while the larger blocks on the roof afforded another opportunity for expression in this medium. Since play activities reflect the interests of child life, careful observations were made to discover the generality and intensity of war play. These children also enjoyed painting, clay modeling, and wood work at frequent intervals.

Various specialists within the school were consulted as to validity of results. The physical education teacher helped check the play interests, the fine arts teacher evaluated the expressions in that area, and the classroom teacher aided in interpretation of the interviews.

Results

Picture Test. Table II shows the frequency of picture choices according to sex.

It is not surprising that the rabbit picture was so frequently chosen since the picture test was made near the Easter season, but it is interesting to note that each one of the 9 girls selected the rabbit picture, while 9 of the 12 boys chose war pictures.

TABLE II

CHILDREN'S CHOICE OF FAVORITE PICTURES

Topics	Boys	Girls	Total
Children in the Snow	1		1
Statue of Liberty	1		1
Rabbit	1	9	10
Cartoon (Hitler and Mussolini)	3		3
Soldiers Embarking	1		1
Dive Bombers	5		5

Information About the War. All records of interviews and conversation were analyzed to determine the amount and nature of the information about the war these children had acquired. A wide range of information about the war was found within the group, the boys possessing much more information than the girls. It was estimated that seven boys had a large amount of information about the war considering their ages, four boys had a medium amount of information and one boy had very little information. Of the girls, on the other hand, three seemed to have considerable information, four only a medium amount and two very little.

Sources of Information. The children showed in their responses that they had access to general sources of information about the war. It was relatively easy to determine which source each one used most. Remarks were frequently made in the interview, such as, "I usually listen to it on the radio," "My brother tells me about it," "My daddy tells me," "I have some programs on the radio I listen to every day," "I read the newspaper myself," were used as a basis for analysis. It was found that conversations with parents constituted the source for most of them, with the radio running a close second, and the movies scarcely at all. The results are summarized in Table III.

TABLE III

SOURCES OF INFORMATION

	Boys	Girls	Total
Conversations with Others	8	7	10
Newspaper or Magazines	3	0	3
Radio	6	2	8
Movies	0	0	0

The following are typical responses to the question, "Tell me what you know about the war."

T: "The Russians are fighting the Germans. We're fighting for freedom. British, Russia, China and America are on our side. The Germans, Italians and Japs are on the other side. We bombed a city of Germans. Last week the paper said that 21 Jap planes were shot down. Hitler is thinking now about using poison gas."

D: "The Japs bombed Pearl Harbor. They are holding some of our islands. The Americans have been driving back the Nazi counter-attacks, the Russians have smashed through the lines where air lines, truck lines, and roads are. The Russians have captured a few villages and ammunition and a few equipment and some guns. I think that the Nazis are taking a counterattack on Russian war places. The Nazi U-boats have sunk vessels of ours. The British have captured a million prisoners."

Dd: "Well, on our side there's Great Britain, Russia and China; on the other side Japan, Italy, and the Germans. My daddy told me. He also told me that we're winning."

The girls were less well informed:

De: "They're fighting because Hitler wants everything. Sometimes the Americans win a little, sometimes the Germans win a little, and sometimes the Japs win a little, too. I don't know who's winning, the Americans, Japs, or Germans. I want to know who's winning."

E: "That ships are being sunk. That the Russians are winning."

M: "I haven't really been thinking about it."

J: "If Hitler makes up with us, we might win the war. France, England, Germany, and the Russians are not on our side. All the countries on our side are America and China.

Leaders. In naming leaders, it was found that all of the children named Hitler as a leader, and that all except four, one boy and three girls, knew him as German or Nazi. One boy and two girls thought that "Uncle Sam is our leader," the rest named Roosevelt. One boy named six leaders and their countries, and included five generals, naming correctly the forces they commanded. One girl named four leaders and their countries. The additional information about the countries included was volunteered; not asked in the question. Table IV summarizes results in this area. Misconceptions such as "Hitler is a

Russian" and "LaGuardia is a leader of some country" were counted wrong, but Queen Wilhelmina and King George of England were accepted in the tabular results.

TABLE IV

NAMING OF LEADERS

Number Named	Boys	Girls	Total
0			
1	1	2	3
2	3	4	7
3	3	1	4
4	2	2	4
5	2		2
6	1		1

Geographical Locations of Soldiers. When the children were asked where our soldiers are, three boys and one girl expressed such conceptions as "all over the world." "everywhere now," then named specific countries. Two girls said, "in the war," but named no specific places. Typical comments follow:

T: "North Africa, Tunisia, Europe, England."

D: "A few of them are in the Solomons. The American Marines are in Guadalcanal."

W. "I can't tell every place. Some are in North Africa. I have a friend there."

J: "Africa, Japan, Russia."

De: "Some are in Texas training, some were in the Philippine Islands before they took the Philippine Islands. They took Paris, too."

Table V summarizes the frequency of locations named.

TABLE V

GEOGRAPHICAL LOCATIONS OF SOLDIERS

Places Named	Boys	Girls	Total
0	0	2	2
1	2	2	4
2	2	1	3
3	2	2	4
4	4	0	4
5	1	1	2
6	1	1	2

Conceptions of the Soldier's Work. All of the children reported that "soldiers fight," most of them adding comments of the following nature: "fighting the enemy," "drilling to get ready to fight." "Fighting to win" or "to kill," "march and fight," and "fight and do many things." The general impression of a soldiers duties seemed to be expressed best by T's remark about his Army father: "He doesn't do anything much, just drills. He doesn't shoot guns at the enemy yet."

Recognition of War-Time Shortages. During the year at various times, the children have discussed the shortages of food. The following lunch-time conversation was recorded on May 4, 1943.

U: "The orange juice is not so high up in the cup today."

M: "Maybe it's hard to get oranges now, but I don't think so."

Jn: "Do you think potatoes will be rationed?"

E: "Meat is so high! My mother has to pay a dollar and something a pound!"

H. "Think of England—one egg a month. Isn't that surprising?"

V. "I know that's true, one egg a month. We just had a letter from a friend of ours in England. He said he had just had a feast of one egg!"

De: "This is going to happen to all of you next year."

E: "My mother has to know how to make coffee. There is not much coffee now."

A: "Sugar, too."

De: "We can hardly get bananas now because they come from far away."

M: "It's the transportation."

P: "We have some supplies but we use so many in the war for soldiers."

De. "We can't get things from far away because we use those ships for something else now—sending supplies to Russia, things like that."

Understanding of War Events. It was difficult to ascertain how much understanding these children have of the present world conflict. Excerpts from the records give some clues as to the meanings they are getting. The first conversation was recorded on February 19, 1943, while the children were taking off their wraps.

H: "The news is not so good in Tunisia this morning, is it? My mother read me the news at breakfast."

E: "The Russians are making Hitler's life miserable. It's too cold."

H. "The Germans are not prepared for winter,"

D. "Nazis are Germans."

M. "Nazis are Italians, I think."

R. "No, they're not, they're Germans."

D. "The Japs are lying down. They pretend they're dead, then when the Americans come along they stick them with bayonets."

R. "K, you're China, aren't you?"

K: "Yes, I'm China. What are you, D?"

D: "I'm Korean."

De. "Then you are our enemy, aren't you? Korea is with the Japs."

D. "No, Korea didn't want to be on the Japanese side. They took them."

E. "Put on your smocks. It's time for pottery."

This remark concluded the war conversation for the time being.

V: "We met a German woman on the bus. Her husband had been in the German Army, then they came over to America and now he's in the American Army."

P. "Why, he may be a spy! I'm telling the F.B.I. They could send him to prison where he belongs! He doesn't belong in our Army!"

V: "They put him in it."

P: "The F.B.I, doesn't know that. They'd put him in prison where he belongs!"

M: "How could they find him?"

P: "They'd find him all right. He's our enemy!"

V: "How could he be our enemy? He's fighting his own people."

M. "He's not our enemy. He belongs in the American Army."

P., verbally vanquished, was still muttering about "spies" as the children started back to working with wood.

Block Building, Creative Art Work, and Dramatic War Play. From observations of the children, evidence as reported by the children about themselves and about each other, questioning the physical education and fine arts teachers, an analysis was made of the types of expression of interest in war. A great deal of war interest was expressed by the children in their creative work. In wood construction the planes and ships were spiked with nails for guns, a realistic fleet of battleships emerged in clay, war pictures were done "with sound effects" in crayon or paint, and there was a new mixing of colors to achieve a dull gray or camouflage effect.

In playing with building blocks, all the boys but one represented the war in their play; only three girls played war with blocks, usually at home with their brothers, the rest of the girls did not use blocks for this purpose.

Evidences of interest in the war shown in pictures drawn was shown by all the boys but one to a great extent, by two girls a great deal, by two girls slightly, five girls not at all. The one exception among the boys was B, who is apparently totally indifferent to the war. B is almost a genius in mathematics and in music, reads at the fifth grade level and has unusual ability in spelling. He is the most immature member of the class socially and engages little in group activities.

Most of the boys owned and played with war toys while very few of the girls did. The following remarks made in the interviews helped in interpretation of expression:

M: "The boys at school and a few girls act out the war. In art they act it out with sound effects—'z-z-z-z-.' 'boom-boom.' 'ack-ack'—as they are drawing war pictures. T. especially, does it. I never see him draw anything except war pictures."

T: "Last year I was in another school and I made animals. I saw so many pictures of the war that I had to change. I like war and I like to make pictures."

M: "I like the war because the planes and ships and tanks are so pretty. It's fun to make pictures of them. It's fun to make a play of forts."

There was a feeling of safety and protection in M's art work and block construction, as contrasted with T's flaming bombing pictures and wicked-looking guns on his block ships. In general the war play seemed to express more interest in construction than in shooting and killing. Table VI shows the frequency with which various media were used by these children in expressing their interest in the war.

TABLE VI

WAYS IN WHICH INTEREST WAS EXPRESSED

	Boys	Girls	Total
Blocks	11	3	14
Creative Work	10	3	13
War Play	11	3	14

Attitudes

Determining emotional reactions proved to be the most difficult part of the study. Consideration was given to observations of the children in many situations, their own reported reactions, attitudes toward Hitler, indications of disturbance through dreams, and in some instances, conversations with parents.

The mother of one of the girls described the child's disturbance for four nights running, following a surprise air raid alarm at five o'clock one morning. The child appeared to forget the incident from that time on. The mother's matter-of-fact attitude seemed to solve the problem.

When questioned by the investigator as to whether children worry about war, De said, "No, I don't think so—not about the war. I get nightmares that give me fits, all about Germans dropping bombs on me, but it's always after my brother has been teasing me."

In the interview, D reported, "I can't get my mind out of the war. Every night I'm thinking about the war. I listen to the radio programs. They scare me. My mother says it's the war programs that give me nightmares, but it's not. It's those other programs. I see ghosts." Three boys told the investigator that they were worried about the war.

As to dreaming about the war, six boys and three girls reported that "many times it disturbs my dreams."

Attitudes Toward Hitler. The mention of Hitler caused a greater reaction than any other question asked in the interview. There were varying degrees of hostility expressed by the children in manner and word descriptions, but all were most emphatic in their attitude of distaste. "Skunk," "dirty," "devil," "crazy," "dopey," "fool," and "stinky dope" were some of the verbal slashes at Hitler.

General Attitudes. Perhaps a remark made by T, who "lives war" more than any child in the group, expresses best the children's general attitude about war: "I like war, but candy is better than war."

An attempt was made to rate each child on general emotionalized attitude toward the war. There appeared to be no "middle ground" attitude. Sex differences were clearly indicated. Results are summarized in Table VII.

Table VII

Attitudes

	Boys	Girls	Total
Enthusiastic or Excited	11	2	13
Casual Interest	0	0	0
Fearful	0	0	0
Indifferent	1	7	8

Summary

This study represents an effort to discover the reactions of young children toward the war. The subjects were 21 school children, above average mentally, between the ages of six and seven. By means of interviews, records of conversation, a picture test, observations of play and use of play media, an analysis was made of their knowledge and understanding of the war. It was found that:

1. These children had more current information about the war than the investigators assumed would be shown.
2. There were wide individual differences among the group in interest and information concerning the war.
3. The adults in the family circle contributed most to the children's knowledge of the war, the radio next, the movies least.
4. There were marked sex differences in all phases of the study, the boys showing far more interest in the war than the girls.
5. A majority of the group expressed knowledge and feelings concerning the war through block play, dramatic war play and drawing.
6. There was relatively little emotional disturbance over the war, judging from an analysis of the interviews and records.

THE RELATIVE INTELLECTUAL ACHIEVEMENT OF MENTALLY GIFTED AND RETARDED CHILDREN

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The relative intellectual achievement of mentally gifted and retarded children under our present educational program is an important problem for the educator. The present study has as its purpose the investigation of findings relative to this problem. McGehee, in his study of retarded elementary school children, concluded that mentally retarded children "are achieving more in the subject matter fields in this investigation than would be anticipated from an analysis of their mental age placements." (6, 52) The writer, in his investigation of mentally superior children, which was based upon the same survey, concluded that, "Gifted children are retarded in school achievement when achievement is considered in relation to intelligence capacity." (5, 66) The writer is of the opinion that these findings are correct if only the mental ages of the groups and their grade placement are considered, as was the case in the above mentioned investigations, but it now seems evident that a very important factor was not considered, namely, the chronological ages of the two groups of children and the length of time the respective groups had been in school. It is quite possible that a consideration of the time the two groups had been in school might lead to different conclusions since the time spent in school should be related directly to their respective opportunities for learning, an important factor in relative achievement.

There are certain conclusions relative to the achievement of mentally gifted and retarded children regarding which there is general agreement at the present time and which McGehee and the writer, in their comprehensive investigations of the achievement of the two groups, substantiated. It is beyond dispute that there is a positive, if not high correlation between mental ability and intellectual achievement, the correlations ranging from +.45 to+.80. It has been shown that the achievement of mentally retarded children is less than that of normal or superior children of the same chronological age. (7,95 and 2,126) It does not follow from this that retarded children are achieving less, in terms of their ability than normal or superior children since it would be absurd to expect them to achieve as much as normal or superior children of the same age. The very meaning of the term mentally retarded implies that dull children possess less learning ability than normal or superior children of the same age. Normal children should achieve more than mentally retarded children, and superior children should achieve more than normal children.

Studies of intellectually gifted children show that these children, as a group, are accomplishing more, in an absolute sense, than normal and retarded children of the same age and grade level. There is such general agreement on this that it can be accepted without question.

It is also true that there is a wide range of intellectual achievement within any given group. Gifted children show a wide range of achievement. The writer (5, 59–61) has shown, in a previous study, that their achievement test scores fall in all ten deciles, with from 13 to 26 per cent falling below the median of their grade. This means that many of this group are achieving far below ability. It is also true that many are achieving far above what might normally be called their capacity, that is above what might be expected in the light of their intelligence test scores. The same is true with regard to the achievement of the mentally retarded group (6, 40–45)

The pertinent question relative to the comparative achievement of mentally retarded, normal and superior children is what each group is achieving in terms of their ability, their chronological age, and the length of time they have been in school. It is a question of relative achievement rather than one of absolute achievement. In other words, the really significant question which needs to be answered is the degree to which each group is achieving what might be expected of them

in terms of their ability and opportunity to learn so that educators can determine where greater effort needs to be applied.

The question to be faced in this study is whether there is any difference between the two groups in relative achievement, that is, whether retardation or acceleration in achievement, relative to ability, as determined by intelligence tests, and time in school, as determined by chronological age, is more characteristic of the mentally retarded or superior group.

The data upon which this study is based were gathered under the auspices of the Advisory Committee of Coordinated Studies in Education, Incorporated. The children to whom the tests were given came from four hundred and fifty-five schools and three hundred and ten communities in thirty-six states. The children in this study were given both the Kuhlman-Anderson Test, from which mental ages and intelligence quotients were computed, and the Unit Scales of Attainment tests, from which achievement test scores were obtained. This battery is composed of eleven tests of which four were selected as being representative of the children's attainment, namely, the reading geography, arithmetic problems, and language usage tests. It must be admitted that it is merely assumed here that these are the most representative of the tests and that they give a fairly typical picture of the children's achievement. The selection was arbitrary but the writer has no reason to believe that an unwise choice was made. Norms were developed for each test, for each grade, and for boys an girls separately. It was found that a sampling of 1200 cases each for boys and girls and for each grade tended to give reasonably stable norms.

The group of gifted children included in this study is the upper ten per cent of each grade, using intelligence quotients as a basis for selection. There are 4,529 children in this groupr, 1,853 boys and 2,676 girls. The lower ten per cent was selected on a similar basis and consists of 4,627 children, 3,009 boys and 1,618 girls. The basic school population from which the selections were made included more than forty-five thousand children.

The measure of the educational achievement of the children included in this study was the Unit Scales of Attainment tests for grades four to eight, composed of Division 1 for grade four. Division 2 for grades five to six and Division 3 for grades seven and eight. The directions for the tests state that scores on the various Divisions are comparable and are to be considered as continuous.

The C-Score keys have been adjusted to give the same C-Scores within the limits of errors of measurement, for the same pupils regardless of the section used, hence the C-Scores are directly comparable from one Form to another.

Another important claim made for the tests is that scores are comparable at any point on the scale.

The C-Score is not only expressed in terms of a consistent unit of measurement throughout the range of the scale, but is an unweighted score in that it has the same meaning at every point on the scale. It is the consistency as well as the definiteness of meaning of the C-Score that makes

TABLE I

A COMPARISON OF THE MEDIAN MA'S OF THE UPPER AND LOWER TEN PER CENT AND THE NORMATIVE GROUP. THE DEVIATIONS OF THE MEDIAN MA'S OF THE UPPER AND LOWER TEN PER CENT FROM THE MEDIAN OF THE NORMATIVE GROUP IN TERMS OF THE QUARTILE DEVIATION OF THE NORMATIVE GROUP ALSO SHOWN

Boys	Grade	Upper 10%	Lower 10%	Norm	Q	Upper 10%	Lower 10%
	4	10.78	8.23	9.80	.61	1.62	—2.57
	5	11.88	9.00	10.60	.59	2.17	—2.71
	6	13.12	10.24	11.69	.76	1.88	—1.91
	7	14.66	11.42	12.73	.71	2.72	—1.85
	8	15.58	11.65	13.15	.85	2.85	—1.77
Girls							
	4	10.83	8.61	10.01	.57	1.42	—2.24
	5	11.89	9.40	10.78	.61	1.82	—2.26
	6	13.20	10.39	11.84	.66	2.06	—2.20
	7	14.79	11.47	13.02	.75	2.38	—2.07
	8	15.58	11.64	13.55	.84	2.42	—2.28

feasible the comparison of gains made at all points on the scale and also from one scale to another.

These are comprehensive claims which would be difficult to substantiate but it is necessary, for the purposes of the study, that they be accepted if any conclusions regarding the relative gains made by the mentally retarded and superior children are to be had.

The median mental ages of these two groups are compared with the median mental ages of the normative group in Table I. The quartile deviations of the median MA's of the upper ten per cent increase consistently grade by grade, except for a slight inconsistency in the quartile deviation of the fourth grade boys. The increase in the divergence of the mental ages of the upper ten per cent is to be expected since their accelerated growth would normally lead to this phenomena. The reverse is not true in the case of the lower ten per cent. There, the greatest divergence is found in the lower grades, except for the large divergence for eighth grade girls, indicating, probably, that many of those of lower intelligence are dropping out of school. The greater divergence of the eighth grade mentally retarded girls probably indicates a tendency to "pile up" the retarded girls at this level rather than send them on to high school. It is probably legitimate to assume that the dull boys are more inclined to drop out of school rather than remain longer in the eighth grade.

The median achievement test scores for the mentally superior, retarded and normative goups are given for each grade and for both boys and girls in Table II. The findings here, as has been pointed out above, agree with the general findings that the lower ten per cent are doing less, absolutely, than either the normative or superior groups, whereas the superior group is achieving more, absolutely, than either the retarded or normative groups. This is as expected and is of no particular significance as such. Sex differences conform to those found in most studies. Boys are distinctly superior in arithmetice problems and almost as definitely superior in geography. Girls are superior in language usage on the basis of every com-

TABLE II

A COMPARISON OF THE MEDIAN C-SCORES ON ACHIEVEMENT TESTS OF THE NORMATIVE GROUP AND THE UPPER AND LOWER TEN PER CENT IN INTELLIGENCE. QUARTILE DEVIATION ALSO GIVEN. BY GRADE AND SEX

	Reading		Geography		Arith. Problems		Lang. Usage	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Fourth Grade								
Norm	62.78	65.57	60.70	61.13	58.89	57.71	61.05	62.26
Q	9.07	7.78	9.40	6.61	7.48	7.03	3.29	3.54
Upper 10%	73.52	73.08	72.00	69.12	67.10	67.20	66.15	66.77
Lower 10%	53.12	54.12	53.36	57.32	54.65	50.50	59.86	60.00
Fifth Grade								
Norm	67.29	71.51	68.53	67.76	72.41	70.25	64.41	65.62
Q	6.64	5.89	8.06	7.66	6.10	5.70	3.92	3.42
Upper 10%	77.94	77.69	74.85	73.06	78.71	75.88	67.42	68.46
Lower 10%	54.48	58.26	57.06	56.53	64.82	61.25	59.10	61.69
Sixth Grade								
Norm	73.51	76.63	73.92	71.99	82.16	77.50	67.01	67.42
Q	7.30	5.71	6.90	6.64	7.09	7.11	4.32	4.51
Upper 10%	82.77	84.00	83.66	83.69	89.03	87.11	71.70	72.53
Lower 10%	66.10	65.23	66.10	65.23	73.77	70.64	62.64	63.80
Seventh Grade								
Norm	77.13	77.75	81.33	78.25	87.85	83.55	71.15	72.90
Q	6.00	6.23	6.18	6.71	8.03	7.69	4.73	5.24
Upper 10%	83.55	85.35	87.10	85.15	97.20	95.20	74.39	78.52
Lower 10%	69.88	68.31	73.90	71.64	77.52	75.27	65.25	67.54
Eighth Grade								
Norm	80.30	81.18	84.45	81.05	94.45	92.25	74.55	77.86
Q	6.55	6.83	6.24	6.50	7.56	8.78	5.18	5.51
Upper 10%	90.59	90.02	92.13	87.89	103.87	101.90	81.17	81.82
Lower 10%	72.63	71.25	76.87	73.30	84.58	78.60	69.23	70.41

parison and also show a slight superiority on the majority of the median reading scores.

The writer has previously pointed out that the significant thing to know relative to the comparative intellectual achievement of children of superior and retarded intelligence is not the absolute achievement of the two groups, since there is no disagreement on that point, but rather the relative achievement of the two groups. This is a problem which has not been thoroughly investigated and it becomes that for which this study is to seek an answer, namely, "Are superior children achieving relatively more or less intellectually than children who are retarded mentally?."

Relative achievement may be measured by comparing the divergence of the median achievement test scores from the norm with the divergence of the median MA's from the norm. The purpose of Table III is to present this information. The basic assumption underlying the construction of this Table is that, if the superior group is working up to capacity, then the median achievement test scores should diverge as much from the norms as do the median mental ages. That is, if the median MA of a group of superior children is two and a half quartiles above the median MA of the normative group, then the median achievement test scores of the superior group should be two and a half quartiles above that of the normative group. It is also assumed that if the median MA of the retarded group were two and a half quartiles below the median MA of the normative group. then the median achievement test scores of the retarded group should be two and a half quartiles below the median achievement test scores of the normative group.

TABLE III

A COMPARISON OF THE SUBJECT MATTER RETARDATION OF THE UPPER TEN PER CENT ON INTELLIGENCE WITH THE SUBJECT MATTER ACCELERATION OF THE LOWER TEN PER CENT ON INTELLIGENCE, SUBJECT MATTER DEVIATION* EXPRESSED AS QUARTILE DEVIATION ABOVE OR BELOW THE MENTAL AGE MEDIAN

Grade			Quartile Deviation of Median M.A.	Reading	Geography	Arith. Problems	Lang. Usage
4	Boys	Upper 10%	1.62	—.44	—.42	—.52	—.07
		Lower 10%	—2.57	1.50	1.79	2.00	2.21
	Girls	Upper 10%	1.42	—.45	—.21	—.07	—.14
		Lower 10%	—2.45	1.02	1.88	1.42	1.81
5	Boys	Upper 10%	2.17	—.57	—1.39	—1.14	—.99
		Lower 10%	—2.71	.78	1.29	1.41	1.11
	Girls	Upper 10%	1.82	—.77	—1.48	—.84	—.79
		Lower 10%	—2.26	.01	.80	.68	.90
6	Boys	Upper 10%	1.88	—.63	—.47	—.91	—.79
		Lower 10%	—1.91	.92	.78	.73	.90
	Girls	Upper 10%	2.06	—.77	—.10	—.71	—.92
		Lower 10%	—2.20	.20	1.18	1.24	1.40
7	Boys	Upper 10%	2.72	—1.32	—1.75	—1.57	2.04
		Lower 10%	—1.85	.66	.66	.59	.60
	Girls	Upper 10%	2.38	—1.16	—1.36	—.87	—1.31
		Lower 10%	—2.07	.55	1.09	1.00	1.05
8	Boys	Upper 10%	2.85	—1.28	—1.65	—1.61	—1.57
		Lower 10%	—1.77	.60	.55	.47	.75
	Girls	Upper 10%	2.42	—1.12	—1.37	—1.32	—1.69
		Lower 10%	—2.28	.83	1.09	.73	.93

* This table is to be interpreted in the following manner. In row one, for example, the median mental age of the upper 10 per cent fourth grade boys is 1.62 quartile deviations of the normative group above median of the normative group. The median reading score of the upper 10% is 1.18 quartiles above the median of the normative group, or .44 quartile deviations lower than the 1.62 quartile deviations of the group on M. A. The median geography score of the upper 10% group is 1.2 quartiles above the normative median, but is .43 quartile deviations below what would be anticipated by the quartile placement of the median MA. On arithmetic problems and language usages the upper 10% medians are 1.10 and 1.55 quartiles, respectively, above the median of the normative group on these subjects, but are in turn .52 and .07 quartiles lower than the quartile deviation of the median of this group on the MA measurement.

Several additional assumptions are involved in the above statement. Such a position assumes that a unit change in intelligence quotient at any level or a years change in mental age, represent similar changes in capacity to learn. It is assumed, in other words, that the range in intelligence quotient from seventy to eighty represents the same difference in capacity as does the range from one hundred and twenty to one hundred and thirty. It is also assumed that the growth in intelligence represented by a change in mental age from seven to eight represents the same increase in learning capacity as the increase from mental age ten to mental age eleven. These are definitely in the nature of assumptions and have been questioned many times. It is necessary, in a study such as this, to make assumptions of this nature since it would be impossible to proceed otherwise.

The comparisons presented in Table III are unfavorable, in every instance, to the superior group, or conversely, they are favorable to the retarded group. The negative deviations of the scores of the superior group show that, in every case, they fail to come up to expectations as expressed by the deviation of their median mental age from that of the normative group. In other words, the negative deviation of their median achievement test scores show the degree to which they fail to attain to the deviation of the median mental age. On the other hand, the positive deviation of achievement test scores of the retarded group show how much nearer these scores are to the median achievement test scores of the normative group than are their median mental age scores.

These differences are emphasized by the comparisons presented in Table IV. This Table shows the quartile deviation of the median MA's of the retarded groups from those of the superior groups. Thus the median MA of the upper ten per cent of the boys in the fourth grade is 4.19 quartiles above the median MA of the lower ten per cent of the boys of that grade using the quartile deviation of the normative boys of that grade. The quartile deviation of the median achievement test scores of the superior boys in that grade are: reading 2.25, geography 1.98, arithmetic problems 1.67, language usage 1.91 quartiles above the achievement test scores for the lower ten per cent boys of the same grade level. Similar results are shown for both boys and girls in all the grades. These findings emphasize the fact that the achievement test scores for the retarded and superior groups are much closer than preoccupation with the mental age placement of the two groups would indicate.

It would be necessary to conclude, if conclusions were based solely on the comparisons presented in these Tables, that the retarded group achieved above expectations in terms of ability whereas the superior group achieved less than expectation in terms of ability. These are the conclusions reported by McGehee (6, 52–53) in his study of retarded children and by Lewis (5, 62, 66) in his study of superior children. Such conclusions are inevitable if only mental age placement is considered but the writer is of the opinion that the investigation should be carried farther before final conclusions are advisable. A very important factor which merits

TABLE IV

A COMPARISON OF THE QUARTILE DEVIATION OF THE MEDIANS OF THE UPPER TEN PER CENT FROM THE MEDIANS OF THE LOWER TEN PER CENT ON MENTAL AGE AND C-SCORES ON READING, GEOGRAPHY, ARITHMETIC PROBLEMS, AND LANGUAGE USAGE. BASED ON THE QUARTILE DEVIATIONS OF THE NORMATIVE GROUP

Grade	Sex	Mental Age	Reading	Geography	Arith. Problems	Language Usage
4	Boys	4.19	2.25	1.98	1.67	1.91
	Girls	3.87	2.40	1.78	2.38	1.92
5	Boys	4.88	2.53	2.20	2.33	2.12
	Girls	4.08	3.30	1.80	2.56	1.98
6	Boys	3.79	2.24	2.54	2.15	2.10
	Girls	4.26	3.29	2.98	2.31	1.94
7	Boys	4.57	2.57	2.16	2.41	1.93
	Girls	4.45	2.74	2.00	2.58	2.09
8	Boys	4.62	2.74	2.42	2.54	2.80
	Girls	4.70	2.75	2.24	2.65	2.08

consideration is that of chronological age and consequent length of time which they have been in school, since that will determine the comparative opportunities for learning.

The writer is aware of no study which deals adequately with the question of the relative achievement of children of superior and inferior mental ability. It is comparatively easy to base relative achievement on the comparative mental age placement of the two groups but that cannot give a complete picture of the situation. The situation can be viewed most readily when the cases of two possible children in the same grade are considered. One boy is nine years of age and has a mental age of ten whereas a second boy is eleven years of age but also has a mental age of ten. The boys both have the same mental age but it certainly would not be fair to the first boy to expcet him to attain as high a score on an achievement test as the older boy, assuming that both boys are in the fourth grade and entered school at approximately the same age. It would also not be fair to call the younger boy retarded because he made a lower achievement test score than the older, or to call the older boy accelerated in achievement because he made a higher score than the younger boy. The older boy, having been in school longer, would have had more opportunity to learn which should have resulted in greater achievement even though his ability is less than that of the younger boy. The writer has come to the conclusion that relative achievement, based solely on mental age placement, is not particularly significant and that it is premature to state that the superior child is neglected, as the writer has done along with others, simply because he does not make as high achievement test scores, relative to his mental age, as the child who is mentally retarded.

Studies of comparative achievement of mentally superior and mentally retarded children have been based almost wholly on comparative mental ages since fairly satisfactory measures of the two variables are available. Chronological age, years in school, and comparative learning opportunities have seldom been considered. It is obvious that these are important factors in achievement. It is indeed very difficult to determine what the relative achievement of mentally superior and inferior children should be when chronological age and learning opportunities are considered. The mental growth of the two groups is quite different and it is not possible, referring again to our two theoretical boys, to assume that the older boy, who has been in school two years longer than the younger boy, had the same learning capacity when he entered school as did the more intelligent boy. In fact, he undoubtedly had a lower mental age when he entered school, and, accordingly, could not be expected to learn as much, in a given period of time, as the younger but more intelligent boy. It is obvious that comparative achievement cannot be computed wholly on the basis of time in school, even though both now have the same mental age. The introduction of varying mental ages at the different grade levels makes it extremely difficult, if not impossible, to compute what should be expected in the way of achievement on the part of the two boys, assuming that both are working to capacity.

Johnson (4) has questioned the conclusion that mentally retarded children are achieving more, relatively, than superior children largely on the basis that observations show that superior children are just as industrious and work just as hard, if not harder, than mentally retarded children. He further points out that the superior child is more successful, more interested in his work, more ambitious, and, hence, more highly motivated, that they are superior in other factors that influence achievement such as health, home conditions, and personality traits. There may be some question about the industry and application of the superior child in many school situations but it is probably true that all of these factors should be given consideration in an investigation of the relative achievement of mentally gifted and retarded children.

Johnson explains the findings, which show dull children to be achieving relatively more than gifted children in their school work, as being due to "regression toward the mean" in the test situation. This explanation does not appear to be either adequate or necessary. It is true, as he contends, that specialization does exist among children and that children should not be expected to do equally well in all subject matter fields. It does appear, though, that, since we are dealing with median scores, the differences might well balance each other.

Johnson's position is that mentally superior children are really children who have a spe-

cial ability which enables them to do well on intelligence tests whereas mentally retarded children are children who do not possess such capacity and, accordingly, make low scores on intelligence tests. He also holds that success in the various school subjects requires other special abilities so that a high correlation between measured intelligence and achievement is not to be expected. He appears to hold that, in the case of mentally superior children, we are probably measuring their most outstanding capacity and should not expect achievement in other subject fields to measure up to that level. The reverse would be true in the case of the mentally retarded children. If this were the case we would expect achievement test scores of the two groups to diverge less than intelligence test scores.

The writer does not see any reason for assuming that intelligence tests tap the outstanding ability of superior children, or for assuming that children selected as superior in intelligence are not equally as good, or even superior in other fields so that among children selected as outstanding by intelligence tests would be found many who are equally, or even more outstanding in other intellectual aspects. It has been shown, as a matter of fact, that children who make high scores on intelligence tests tend to be outstanding in other abilities. It also does not appear legitimate to assume that children who score low on intelligence tests are not equally weak, or weaker, in many cases, in other intellectual capacities.

The writer cannot agree with this explanation of the findings relating to the relative achievement of mentally superior and retarded children. The typical intelligence test inclues a wide range of items and appears to be a fair measure of learning capacity, particularly at the level of this study. It is probably true that above the level of this study, notably at the high school age, too many extraneous factors enter into mental test scores and that intelligence tests tend to become more nearly achievement tests.

Johnson is undoubtedly correct in holding that factors making for successful achievement, such as industry and motivation, are not measured by intelligence tests. Studies of mentally superior and retarded children have shown that industry and high motivation are more characteristic of superior than of dull children. These would tend to make for greater relative achievement on the part of superior children. It is necessary to admit, that on the basis of findings to date, superior children appear to be working below capacity whereas dull children appear to be working above capacity. The writer does not believe that Johnson has found the answer to the problem. It would appear that a more fruitful approach to the problem might be found through a consideration of respective chronological ages and the consequent difference in school attendance and learning period.

The data presented in Tables V and VI show that the various groups differ in age and this age difference must be given due consideration before it can be determined whether the generally accepted view (1,561) is correct, that is, that mentally retarded children are achieving more, on the average, in our elementary schools than mentally superior children. It is evident from Table V that superior children in a given grade are younger, on the average, than the normative or dull children whereas the mentally retarded children are older, on the average, than the other groups. The boys of the superior group average approximately eight-tenths of a year younger than the normative group and from 1.86 years, at the eighth grade level, to 2.82 years, at the fourth grade

TABLE V

A COMPARISON OF THE MEDIAN CHRONOLOGICAL AGE OF THE NORMATIVE GROUP, THE UPPER AND LOWER TEN PER CENT, BY GRADE AND SEX

Sex	Group	Grade 4	5	6	7	8
Boys	Norm	9.73	10.78	11.78	12.75	13.74
	Upper 10%	8.96	10.01	10.90	11.90	13.00
	Lower 10%	11.78	12.72	13.57	14.32	14.86
Girls	Norm	9.50	10.58	11.53	12.68	13.58
	Upper 10%	8.95	10.00	10.97	12.00	13.13
	Lower 10%	11.77	12.73	13.52	14.27	14.49

TABLE VI

A COMPARISON OF THE DIFFERENCES IN CHRONOLOGICAL AGE OF THE NORMATIVE GROUP, UPPER AND LOWER TEN PER CENT, BY GRADE AND SEX

		Grades				
		4	5	6	7	8
Boys	Norm—Lower 10%.....	2.05	1.94	1.79	1.57	1.12
	Norm—Upper 10%.....	—.77	—.77	—.88	—.85	—.74
	Upper 10%—Lower 10%.....	2.82	2.71	2.67	2.42	1.86
Girls	Norm—Lower 10%.....	2.27	2.15	1.99	1.59	0.91
	Norm—Upper 10%.....	—.55	—.58	—.56	—.68	—.45
	Upper 10%—Lower 10%.....	2.82	2.73	2.55	2.27	1.36

level, younger than the mentally retarded group. The differences are not quite so large for the girls. The mentally superior girls average about fifty-five hundredths of a year younger than the normative girls and are from 2.82 to 1.36 years younger than the mentally retarded girls, the differences decreasing regularly from the fourth to the eighth grade.

The assumption that the mentally superior children have been in school for a shorter period than the mentally retarded children appears legitimate. (8 an 9) It does not appear to distort the situation to assume that both the dull and superior children started to school at about the same age, that is, around six. Proceeding on this assumption, it would appear that the mentally retarded fourth grade children have been in school more than six years, on the average, whereas the mentally superior children have been in school considerably less than four years. The differences are not as great at the eighth grade level since many of the mentally retarded who have been in school for the greatest length of time appear to have dropped out of school but it appears that the superior group has been in school approximately seven years whereas the dull group has been in school, on the average, approximately nine years.

It would be necessary, before arriving at any conclusion as to what each group has achieved in relation to their capacity, to determine what level of achievement is to be expected of bright fourth grade children of mental age 10.8 years who have been in school considerably less than four years, on the average, as compared with dull fourth grade children of mental age 8.4 years who have been in school, on the average, approximately six years. It should be evident that the problem of determining how nearly these two groups are working relative to capacity involves a number of variables, most important of which are different rates of mental development and different learning periods.

A reconsideration of the data in Tables II and III, taking into consideration the time each group has spent in school, suggests that Table III might be quite different should this factor be given its due weight. Taking into consideration the gains which the superior group is shown as making in a year's time, it appears that many of the negative deviations might disappear. On the other hand, if it should be taken into consideration that the retarded children have been in school for a longer period, it appears that many of the positive deviations might disappear, or even become negative. Table III has not been revised so as to give due consideration to the time factor since there appears to be no means of determining the time effect accurately. It is questionable, for example; whether many of the dull children should be expected to learn much their first year in school since their level of maturation is such that they possess little learning readiness. It appears that Table III exaggerates the relative achievement of the retarded children and underestimates relative achievement of the superior children.

Another approach to the problem of the relative achievement of gifted and dull childen may be had through a study of develop-

ment as shown by a comparison of educational ages, obtained from median achievement test scores and Unit Scale of Attainment norms, for grades four and eight, as shown in Table VII. This comparison involves acceptance of the assumption that C-Scores are directly comparable from one Division to another and that C-Scores have the same meaning at every point on the scale. The normative group shows expected development, appoximately four years, except for reading where the growth is three years and one month for the boys and three years and five months for the girls and in geography where the girls show a growth of only three years and five months. There is no apparent reason for this but it should be pointed out that only one year's growth is shown in the two years from grades four to six.

The mentally retarded group shows fairly large gains except in reading. It is probably true that part of this apparent gain is spurious and is brought about by the dropping out of the oldest and dullest. This statement is based upon two facts: (1) the median intelligence quotient rises from approximately 78 at the fourth grade level, to 86 at the eighth grade level, (2) and there is only three years difference in the average chronological age of fourth and eighth grade groups, indicating that many of the oldest children have dropped out of school. This very probably also indicates that many of those of lowest achievement have dropped out of school. It is impossible, however, to know what part of the gain in the median scores of the dull group is real, what part an artifact of the situation. It is of interest to note that the gains are lowest in reading, where ability counts heaviest and effort, perhaps, the least. Whether these gains are greater than might be expected in terms of their ability, is not certain, in view of the factors mentioned, although it appears that they are at or above expectation except in reading.

The upper ten per cent show, Table VII, rather large gains in reading and arithmetic problems (approximately five years gain in four years) but their gains are no larger than those of the normative group in geography and language usage. It appears, when the total situation is considered, that the upper ten per cent is making expected gains and, therefore, are not to be considered as working up to capacity. It is impossible to state just what their achievement would be if they were working up to capacity but it certainly would be greater than that of the normative group.

Another comparison, which is pertinent to the problem of the relative achievement of mentally superior and dull children, may be obtained from the fourth grade median achievement test scores. The median educational ages, as shown by median scores, range from 8–7 to 9–4 for the lower ten per cent which it has taken them on an average of five and three-quarter years to attain, assuming that they started to school at six, whereas the upper ten per cent have achieved median mental ages of from 10–8 to 11–5 in approximately three years. In other words, the superior children have achieved educational ages about two years in advance of the dull children, at the fourth grade level, in approximately half the time.

It is evident that the data which have been presented in this study do not justify any more than tentative conclusions. The comparisons given in Tables III an IV indicate that the retarded children are working above expectation, based on mental age, whereas the superior group is working below expectation. It has been pointed out that , if chronological age and time spent in school could be accurately reflected in such a table, the contrasts would not be so striking, although it appears probable that the retarded group would still appear to be working somewhat above expectation and the superior group

TABLE VII

COMPARISON OF THE PROGRESS MADE BY NORMATIVE GROUPS, UPPER TEN PER CENT, AND LOWER TEN PER CENT FROM GRADES FOUR TO EIGHT AS SHOWN BY GROUP MEDIANS ON UNIT SCALES OF ATTAINMENT BATTERY

	Reading		Geography		Arith. Problems		Language Usage	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Normative	3–1	3–5	3–11	3–5	4–0	3–9	3–8	4–0
Upper 10	5–1	5–0	3–11	3–3	5–2	4–9	3–9	3–9
Lower 10	2–0	1–9	3–5	2–3	3–1	2–6	2–11	3–1

working below capacity. Perhaps the most pertinent evidence indicating that the superior group is working below capacity is found in Table VII where no larger gains are shown for the superior group in geography and language usage than for the normative group.

An investigation of the literature relating to the educational achievements of gifted children will refute, we believe, Johnson's (4) position that the findings, which show that gifted children are not working up to capacity are incorrect and are a product of "regression to the mean." Studies that are particularly pertinent are those dealing with special classes for gifted children where they are given more attention than in the ordinary schoolroom and where we can obtain a clearer picture of what is their capacity.

Cobb and Taylor (3) reported on the educational achievement of the selected group of gifted children who were in the Special Opportunity Class of Public School 165, Manhattan, in the early twenties. The pupils in this class were given the Stanford Achievement Test which showed the achievement of the group to be uniformly high. Every child surpassed the average for his chronological age on every single test. They report a "general tendency," for a child's educational age to fall below his mental age. The differences are approximately the same as those found in this study—average age in achievement test fourteen years and one month, average age on intelligence test fourteen years five and one-half months. This might be interpreted as indicating that most of these children were working below capacity. It is significant to note, however, that one-third of them were shown as working above expectation, as indicated by intelligence tests. A comparison of chronological age and grade status reveals that all of these children have been advanced rapily and were from one to five years ahead of their age groups, with a few exceptions who were at age level. Is it correct to say that children are not working up to capacity when they have attained an educational age within five months of their mental age in much less time than average children? It does not appear to be correct to say that these children are not achieving what might be expected of them in view of the time they have spent in school.

Terman pointed out (13,304) that the educational achievement of his group of gifted children was very high. It amounted, in most cases, to from three to four times the standard deviation of the norm for their age. He concludes that the outstanding thing about their achievement is that they accomplished so much in the various school subjects in such a short period of instruction.

Stedman (10,107–108), reporting on the accomplishments of a group of gifted children in a special class, found that their educational accomplishments were approximately ninety-eight per cent of expectation based on mental age. This level was attained notwithstanding reduced time for learning due to extra time given to extra-curricular activities. She expressed the opinion that their educational achievement would have been raised above the mental age expectation if the children had been placed in a special class at an earlier age.

Witty found that his gifted children were not achieving up to expectation but, two years after the tests were given, all the children had mean scholastic ranks above the average except one boy who ranked average. Unfortunately for the purposes of this study, Witty and Terman, writing at a time when rapid advancement was thought to be the solution of all problems in the education of superior children, were interested mainly in achievement relative to grade placement, rather than achievement relative to capacity, so that their studies throw little light on our problem.

Sumption (11,50) has reviewed the educational achievement of gifted children in the Major Work program of the Cleveland shcools. Less time is spent on the regular school work in this program (11,38) so that the learning and instructional time for the children is shortened making comparisons with achievement in regular school programs impossible. Three achievement tests were used in evaluating the achievement of these children, the Stanford, the Metropolitan, and the Progressive. The Stanford test showed the children to be "far above the achievement of comparable normal pupils in Cleveland." The Metropolitan revealed the children to be "well above the test norms for children of their chronological age." They were in general, somewhat below the norms for their mental age. The Progressive test showed the children in the Major Work program to be

"more than two years ahead of normal children of their chronological age."

The achievement of gifted children studied by Cobb and Taylor, Terman, an Witty is not to be considered as typical of gifted children in our schools since achievement was an important factor in the selection of those groups. The children included in the Cobb and Taylor, and Terman investigations were selected because their achievement brought them to the attention of someone. Witty used the National Intelligence Test as his primary measuring instrument and that test appears to be more influenced by achievement than other scales. It is to be expected, then, that all of the children in these groups achieved as much, or more than average children. The writer, on the other hand, has shown (5,59–61) that the achievement of many mentally gifted children in regular school classes is below average and others have reported similar findings.

The findings of the various investigations cited above indicate that the achievement of gifted children can reach a high level if they are given proper attention. Many far surpass expectation as determined by mental age.

Special classes for gifted children, notably the Major Work program in Cleveland and the special groups of Dr. L. S. Hollingworth in New York City, have not contributed a great deal to the solution of the problem of the relative achievement of gifted children since, in both of these projects, only a part of the day was spent on the regular school program. This means that less time is given to those phases of the work measured by achievement tests than in the ordinary school. Such programs do emphasize the fact that gifted children can and do learn more, in less time, than average or dull children.

The primary considerations in this investigation of the relative achievement of mentally gifted and retarded children have been the factor of mental age and length of learning period. The assumption has been that mental age and length of learning period are the only important factors in achievement. Other factors, such as motivation, personality traits, home environment, and general attitude in the classroom have been shown to be factors in achievement. These, to an important degree, are more characteristic of gifted than of retarded children.

It is generally agreed, for example, that one of the most powerful forms of motivation is the experience of success and certainly the gifted child knows success to a far greater degree than the dull child who must constantly face the fact of failure while the gifted child enjoys the thrill of success. All studies have shown that the home conditions of gifted children are superior to those of the mentally retarded, and home conditions are an important factor in educational achievement. Personality traits in general, and emotional stability are not, generally speaking, important factors in educational achievement. There are, however, some traits which are an aid in achievement and superior children have been shown to possess them to a far greater degree than average or dull children. Particularly significant are traits such as ambition, investigativeness, originality, persistence and self-reliance. Dull children, on the other hand, possess traits that would stand in the way of satisfactory achievement to a far greater degree than bright children and their classroom adjustment tends to be less satisfactory. The bright child has a far wider range of interests, particularly in fields associated with education, than does the dull child and these should contribute to high educational achievement.

These factors are all more or less intangible and incommensurable. The writer is aware of no way of determining exactly what they might be expected to contribute toward educational achievement. Granting that they do contribute to educational achievement, it would appear that we are expecting too much of the dull child and too little of the bright child when expectations of achievement are based solely on mental age and time spent in learning.

The determination of the relative achievement of mentally gifted and retarded children, obviously involves so many variables, whose influence cannot be exactly determined, that all conclusions must be tentative, or at least circumscribed with reservations. It appears that, in general, previous conclusions are probably approximately correct in so far as they indicate that mentally retarded children are doing better than might be expected in terms of their ability and that superior

children are not achieving up to legitimate expectations.

It is not surprising that the dull child is achieving quite well in terms of his ability since, it is admitted, that in most school situations pressure is on the teacher to push the dull child ahead as rapidly as possible and the superior child can usually be more or less neglected since he tends to take care of himself. It is also evident that, in far too many schoolrooms, the bright child finds little to interest him and becomes dull, listless and, at times, troublesome.

Special projects in the education of gifted children have shown that their level of achievement can be raised by giving them as much attention as the dull children receive and that they can achieve much more than dull or average children in much less time, both in years spent in school or hours of the school day given to the standard curriculum. This would seem to provide the best evidence that the gifted child is working below capacity. His level of achievement rises when he is given the attention that is due him.

The writer believes that it is necessary to be conservative in drawing conclusions for the present until we can know more accurately the effects of various mental age levels on achievement, the influence of time spent in school and consequent length of learning, and the effects of home conditions, pesonality traits, motivation and interests upon achievement.

The information which is available appears to indicate that mentally retarded children are achieving well, even taking into consideration their relatively long learning period and even though they face numerous handicaps. This is probably due to the effort that is made to bring them to a level where they can be sent on to the next grade. The achievement of gifted children has probably been under-estimated because the shorter period of learning, which most of them have had, has been generally ignored. It is quite possible, however, that because of their ability, superior motivation, personalities, and home conditions, their achievement can be brought above expectations if they are given the attention which their superior capacities for learning justify.

Bibliography

1. Brown, Andrew W. and Lind, Christine. "School Achievement in Relation to Mental Age." *Journal Educational Psychology*, (1931), XXII, 561–76.
2. Carroll, Herbert A. *Genius in the Making*. New York: McGraw-Hill Book Co., 1940. Pp. xi + 307.
3. Cobb, M. V., and Taylor, G. A. "Stanford Achievement Tests with a Group of Gifted Children." *Yearbook of National Society for Study of Education*, 1924, XXIII, 275–289.
4. Johnson, H. G. "Does the Gifted Child Have a low AQ?" *Journal of Educational Research*, 1942, XXXVI, 91–99.
5. Lewis, W. Drayton. "A Study of Superior Children in the Elementary School." George Peabody College Contributions to Education, 1940, No. 266. Pp. 104.
6. McGehee, William. "A Study of Retarded Children in the Elementary School." George Peabody College Contributions to Education, 1939, No. 246, Pp. 128.
7. Merrill, Maud H. "On the Relation of Intelligence to Achievement in the Case of Mentally Retarded Children. *Com. Psychol. Monog.*, 1924, 2, No. 10, Pp. 1–100.
8. Nifenecker, Eugene A. *A Review of Departmental Experience in Dealing with Problems of School Maladjustment, part II*. Publication No. 28, New York: Board of Education of the City of, 1937. Pp. 287.
9. St. John, C. W. *Educational Achievement in Relation to Intelligence as Shown by Teachers' Marks, Promotions, and Scores in Standard Tests in Certain Elementary Grades*. Harvard Studies in Education, 1930, Vol. 15 Pp. XIV + 219.
10. Stedman, Lula M. *Education of Gifted Children*. Yonkers-on-Hudson, N. Y.: World Book Co., 1924. Pp. viii + 192.
11. Sumption, Merle R. *Three Hundred Gifted Children*. Yonkers-on-Hudson; N. Y.: World Book Co., 1924. Pp. xviii + 235.
12. Witty, P. A. *Study of One Hundred Gifted Children*. Kansas Studies in Education, No. 13, 1930, 1, 3–44.
13. Terman, L. M. *Genetic Studies of Genius*, Vol. I. Stanford University: Stanford University Press, 1925. Pp. XV + 648.